

AB
CML than a first threshold, the determining section determines a change in directivity of the first signal.

REMARKS

Upon entry of the present amendment, Applicant will have canceled claim 2 and will have submitted claim 20 for consideration. Applicant will have amended claims 1 and 3-15.

In view of the herein contained amendments and remarks, Applicant respectfully requests reconsideration and withdrawal of each of the outstanding rejections and objections, together with the allowance of all the claims pending in the present application, in due course. Applicant submits that such reconsideration and allowance is now appropriate and is thus respectfully requested.

In the above-mentioned Official Action, the Examiner rejected claims 1, 2, 3, 6, 17 and 18 under 35 U.S.C. 102(b) as being anticipated by Forssen (USPN 5,615,409).

Applicant respectfully traverses the above rejection and submits that it is inappropriate, particularly when considered with respect to Applicant's independent claim 1.

The present invention is directed to a base station apparatus, in particular, including a reception section that receives a reception power ratio of the first signal to the second signal measured by a mobile station apparatus, and a determining section that

determines whether the directivity of the first signal should be changed based on a difference between a transmission power ratio of the first signal to the second signal and the reception power ratio. A directivity control section changes the directivity of the first signal based on a result determined in the determining section. Thus, the directivity of the first signal is changed based on both of the reception power ratio and the transmission power ratio. In addition, the present invention determines whether the directivity of the first signal should be changed after the first signal and second signal have already been transmitted.

On the other hand, Forssen, in particular, discloses two channels with respective directivities having different widths, and a base station apparatus that receives signals with a wide directivity before detecting a position of a mobile station, and receives signals with a narrow directivity after detecting the position of the mobile station.

The Examiner pointed out, in particular, that Forssen discloses a base station apparatus wherein the determiner measures a transmission power ratio, which is the ratio of the transmission power of the first signal to the transmission power of the second signal, measures a reception power ratio, which is the ratio of the reception power of the first signal to the reception power of the second signal (column 4, line 60 to column 5, line 15). However, this portion relates to general reception directivity weight control, and does not indicate the features that the Examiner has asserted.

Thus, Forssen does not disclose a reception section that receives the reception power ratio measured by the mobile station apparatus and the determining section that determines whether the directivity of the first signal will be changed based on the difference between the transmission power ratio and the reception power ratio.

In radio communications, a base station transmits a signal with directivity to a plurality of mobile stations. It is thus necessary to accurately determine whether lower reception power in a mobile station is caused by improper directivity or low transmission power, and to control the transmission power and directivity. According to the combination of the present invention as claimed in claim 1, the present invention can determine whether the low reception power in a mobile station is caused by improper directivity or low transmission power based upon the transmission power ratio of a first signal with a narrow directivity to the second signal with a wide directivity in a base station, and upon the reception power ratio in a mobile station.

Accordingly, it is respectfully submitted that Forssen does not disclose the combination of features recited in Applicant's amended claim 1.

Claim 2 has been canceled. Claims 3, 6, 17 and 18 depend from claim 1, and Applicant submits that these claims are also patentable over the cited art, at least in view of the recitations of claim 1. In addition, claim 6, in particular, specifically recites the change of directivity orientation. Forssen only relates to a technique that a signal with a

narrow directivity will be transmitted, and does not describe changing a direction of the signal with a narrow directivity.

In the above Official Action, the Examiner also rejected claims 4, 12-16 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Forssen in view of Suzuki (USPN 5,978,657). The Examiner further rejected claims 7 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Forssen in view of Ward (USPN 6,167,286).

Applicant respectfully traverses the above rejection and submits that it is inappropriate, particularly when considered with respect to Applicant's independent claim 15.

Claim 15 is directed to a radio communication method, in particular, including, measuring of reception power of the first signal and the second signal by a mobile station and transmission of the measurement results to a base station apparatus, and, measuring, by the base station apparatus, a transmission power ratio, which is a ratio of transmission power of the first signal to transmission power of the second signal, measuring of a reception power ratio which is a ratio of the reception power of the first signal to the reception power of the second signal transmitted from the mobile station apparatus. Claim 15 further recites determining, by the base station, whether the directivity of the first signal should be changed based on the difference between the transmission power

ratio and the reception power ratio and changes the directivity of the first signal based on a determination result.

As described above, Forssen does not disclose the combination of these features. Particularly, Forssen does not disclose measuring a reception power ratio of a signal with a narrow directivity to a signal with a wide directivity, or determining whether or not to change the directivity of the first signal based on the difference between the transmission power ratio and reception power ratio. In addition, Suzuki does not disclose these features at all, and thus cannot overcome the deficiencies of Forssen with respect to claims 4, 12-16 and 19.

Accordingly, it is respectfully submitted that Forssen does not disclose the combination of features recited in Applicant's amended claim 15.

Claims 4, 7-8, 12-14, 16 and 19 depend from claim 1 or 15. Thus, Applicant submits that these claims are also patentable over the cited art, at least in view of the recitations of claim 1 or 15. In addition, Ward does not disclose the feature of claim 1, and thus cannot correct the deficiencies of Forssen with respect to claims 7 and 8.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the outstanding rejection of the claims under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a).

In the above Official Action, the Examiner objected to claims 9-11 as being dependent upon a rejected base claim. However, the Examiner indicated that these

claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Examiner's indication is appreciated. However, as clearly described above, the amended base claim 1 includes patentable features. Accordingly, Applicant respectfully submits that the objected claims 9-11 are also allowable without amending them in an independent form, at least in view of the recitations of claim 1, as well as the admitted allowable features of claims 9-11.

Newly submitted claim 20 also depends from claim 1, and is allowable at least in view of the recitations of claim 1.

SUMMARY AND CONCLUSION

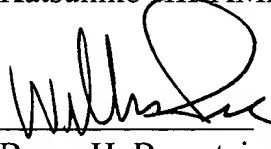
Applicant has made a sincere effort to place the present application in condition for allowance and believes that he has now done so. Applicant has amended the claims, canceled a claim and submitted a new claim to more particularly define Applicant's invention. Applicant has discussed the disclosure of the references cited by the Examiner and has compared the same with the recitations of the claims in the present application. Applicant has pointed out the significant and substantial shortcomings and deficiencies of the reference applied by the Examiner with respect to the combination of features recited in Applicant's claims. Accordingly, Applicant has provided a clear evidentiary basis supporting the patentability of all the claims in the present application and respectfully requests an indication to such effect, in due course.

P18671.A04

Any amendments to the claims which have been made in this amendment, and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

Should the Examiner have any questions or comments regarding this response or the present application, the Examiner is respectfully requested to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
Katsuhiko HIRAMATSU



Bruce H. Bernstein
Reg. No. 29,027

June 20, 2002
GREENBLUM & BERNSTEIN, P.L.C.
1941 Roland Clarke Place
Reston, VA 20191
(703) 716-1191

MARKED-UP COPY OF CLAIMS

1. (Amended) A base station apparatus comprising:

a downlink [transmitter to transmit] transmission section that transmits a first signal with a directivity directed to a [specific] mobile station apparatus and [transmitting] a second signal [to another mobile station apparatus] with directivity [different from] wider than that of [said] the first signal;

a reception section that receives a reception power ratio of the first signal to the second signal measured in the mobile station apparatus;

[determiner to determine] a determining section that determines whether the directivity of [said] the first signal should be changed [or not] based on a difference between a transmission power ratio of the first signal to the second signal and the reception power ratio; and

a directivity [controller to change] control section that changes the directivity of [said] the first signal based on [this] a [determination] result of determination by the [determiner] determining section.

3. (Amended) The base station apparatus according to claim 1, wherein, if the difference between [said] the reception power ratio and [said] the transmission power ratio is greater than [the predetermined] a first threshold and [at the same time] the mobile

station apparatus to which the first signal was [sent] transmitted requests the transmission power to be increased, the [determiner] determining section determines that the directivity of [said] the first signal should be changed.

4. (Amended) The base station apparatus according to claim 1, wherein, if the difference between [said] the reception power ratio and [said] the transmission power ratio is greater than [the predetermined] a first threshold and [at the same time] the reception power of a signal transmitted from the mobile station apparatus to which the first signal was [sent] transmitted is smaller than a [predetermined] second threshold, the [determiner] determining section determines that the directivity of [said] the first signal should be changed.

5. (Amended) The base station apparatus according to claim 1, further comprising a transmission power [controller to control] control section that controls [the] transmission power of a transmission signal, [said] the transmission power [controller does not change] control section not changing the transmission power if the [determiner] determining section determines that the directivity should be changed.

6. (Amended) The base station apparatus according to claim 1, wherein, if the [determiner] determining section determines that the directivity should be changed, the directivity [controller] control section changes the directivity orientation without changing the width of the directivity.

7. (Amended) The base station apparatus according to claim 1, wherein, if the [determiner] determining section determines that the directivity should be changed, the directivity [controller] control section broadens the width of directivity [by a certain amount with respect to the width of the previous directivity] of the first signal, adjusts [the] transmission power, changes the directivity orientation and returns the width of directivity to the original value.

8. (Amended) The base station apparatus according to claim 1, wherein, if the [determiner] determining section determines that the directivity should be changed, the directivity [controller] control section broadens the width of directivity [drastically] of the first signal, [changes the directivity orientation,] adjusts the directivity orientation and then returns the width of directivity to the original value.

9. (Amended) The base station apparatus according to claim 1, wherein the [determiner] determining section sets a third threshold greater than [the] a first threshold, and if the difference between the reception power ratio and [said] the transmission power ratio is greater than the third threshold, determines that [the] a directivity shift of the first signal is [greater] large, and if the difference between the reception power ratio and [said] the transmission power ratio is greater than the first threshold and smaller than the [second] third threshold, determines that the directivity shift of [said] the first signal is [smaller] small.

10. (Amended) The base station apparatus according to claim 9, wherein if the [determiner] determining section determines that the directivity shift of the first signal is [greater] large, the directivity [controller] control section broadens the width of directivity [drastically] to adjust the directivity, and if the [determiner] determining section determines that the directivity shift of said first signal is [smaller] small, the directivity control section does not change the width of directivity but changes the directivity orientation.

11. (Amended) The base station apparatus according to claim 9, wherein, if the [determiner] determining section determines that the directivity shift of the first signal is [greater] large, the directivity [controller] control section broadens the width of directivity, [and changes the directivity,] adjusts the directivity and then returns the width of the directivity to the original value, and if the [determiner] determining section determines that the directivity shift of [said] the first signal is [smaller] small, the directivity control section does not change the width of directivity but changes the directivity orientation.

12. (Amended) A mobile station apparatus comprising:

a first measuring [means for measuring the] section that measures reception power of [a] the first signal transmitted from the base station apparatus according to claim 1 to [said] the mobile station;

a second measuring [means for measuring the] section that measures reception power of [a] the second signal transmitted from the base station apparatus to an apparatus other than [said] the mobile station; and

an uplink [transmitter for transmitting the] transmission section that transmits measurement results of [said] the first and second measuring [means] sections to the base station apparatus.

13. (Amended) The mobile station apparatus according to claim 12, further comprising a reception power calculating [means for calculating] section that calculates a reception power ratio, which is a ratio of the reception power of the first signal to the reception power of the second signal, wherein the uplink [transmitter] transmission section transmits [said] the reception power ratio.

14. (Amended) The mobile station apparatus according to claim [12] 13, wherein the reception power calculating [means] section uses a common signal applicable to any mobile station [apparatuses] apparatus as the second signal.

15. (Amended) A radio communication method, wherein a base station apparatus transmits a first signal having a directivity directed to a [specific] mobile station apparatus, [at the same time] transmits a second signal to [another] an apparatus other than [said] the mobile station apparatus with directivity [different from] wider than that of [said] the first signal, [said] the mobile station apparatus measures the reception

power of [said] the first signal and [said] the second signal and transmits the measurement results to the base station apparatus, [said] the base station apparatus measures a transmission power ratio which is a ratio of [the] transmission power of [said fist] the first signal to the transmission power of [said] the second signal, measures a reception power ratio which is a ratio of the reception power of [said fist] the first signal to the reception power of [said] the second signal transmitted from the mobile station apparatus, determines whether the directivity of [said] the first signal should be changed [or not] based on the difference between [said] the transmission power ratio and [said] the reception power ratio and changes the directivity of [said] the first signal based on [the] a determination result.